

REMARKS

Applicant has amended the specification of the above-identified application in order to correct typographical errors, including errors pointed out by the Examiner on page 2 of the Office Action mailed May 5, 2004. In view of these amendments to the specification, it is respectfully submitted that the required corrections set forth by the Examiner on page 2 of the Office Action mailed May 5, 2004, have been made.

Applicant has amended his claims in order to further clarify the definition of various aspects of the present invention. Specifically, Applicant has have cancelled claims 1, 4 and 5 without prejudice or disclaimer, and are adding new claims 8-12 to the application. Of these newly added claims, claims 8-10 are independent claims; and in connection therewith, note previously considered claims 1, 4 and 5, respectively.

New independent claim 8 defines an exhaust gas processing apparatus used in a diesel vehicle, including an interference chamber, a centrifugal separation machine and an NOx decomposition unit, with the centrifugal separation machine provided at a downstream side of a first exhaust gas pipe of the interference chamber (this first exhaust gas pipe being at an engine side of the interference chamber) and the NOx decomposition unit being connected to the centrifugal separation machine and provided at an upstream side of a second exhaust gas pipe of the interference chamber (this second exhaust gas pipe being at an exhaust gas side of the interference chamber). Claim 8 further recites that the centrifugal separation machine and NOx decomposition unit are arranged separately from the

interference chamber; and that the NOx decomposition unit includes a barrier discharge electrode portion which includes an insulation electrode portion and plural discharger disc plates having plural discharge portion slits at an outer periphery of the insulation electrode portion, whereby a particle shape substance in an exhaust gas is caught. Note, for example, Fig. 1A and Figs. 3A-C, among other portions of Applicant's original disclosure.

Independent claim 9 recites that the exhaust gas processing apparatus includes the interference chamber, the centrifugal separation machine and the NOx decomposition unit; recites separate arrangement of each of the centrifugal separation machine and the NOx decomposition unit from the interference chamber, and that the NOx decomposition unit includes a barrier discharge electrode portion, as in claim 8; and further recites that, as an anti-environment material, at least one of a brush, a heater, a burner and a high pressure injection nozzle is provided separately from a processing system having the interference chamber.

New claim 10 defines an exhaust gas processing apparatus having the components as recited in claim 8, and recites additionally that to catch and decompose a particle shape substance in an exhaust gas and a substance containing at least NOx, the interference chamber mitigates and averages a change of a flow in a front stage of a processing system having the interference chamber.

Claims 11 and 12, each dependent on any one of claims 8-10, respectively recites that the centrifugal separation machine is separately arranged from the NOx decomposition unit, with the NOx decomposition unit being downstream of the

centrifugal separation machine; and recites the further structure of a dust collection filter between the centrifugal separation machine and the NOx decomposition unit. Note, for example, dust collection filter 15 seen in Fig. 1A.

Claims 2, 3, 6 and 7 have been amended in light of the canceling of claims 1, 4 and 5, and the addition of new claims 8-10. Moreover, these claims 2, 3, 6 and 7 variously have been amended to recite the centrifugal separation machine (rather than at least one centrifugal separation machine); to specify a processing system having the interference chamber; and to specify a centrifugal separation machine rather than a cyclone.

The claim objections as set forth on page 2 of the Office Action mailed May 5, 2004, are noted. Thus, "etc." has been deleted from the claims; and, in connection with contentions made by the Examiner with respect to claim 5, claim 10 recites an interference chamber, and also recites that the interference chamber mitigates and averages a change of a flow in a front stage of a processing system having the interference chamber. In view of new claims 8-10, it is respectfully submitted that claim objections with respect to claims 1, 4 and 5 on page 2 of the Office Action mailed May 5, 2004, are moot.

Applicant respectfully submits that all of the claims presented for consideration by the Examiner patentably distinguish over the teachings of the references applied by the Examiner in rejecting claims in the Office Action mailed May 5, 2004, that is, the teachings of U.S. Patent No. 4,693,078 to Dettling, et al.,

and U.S. Patent No. 4,649,703 to Dettling, et al., under the provisions of 35 USC §102 and 35 USC §103.

It is respectfully submitted that these references as applied by the Examiner would have neither taught nor would have suggested such an exhaust gas processing apparatus as in the present claims, having, inter alia, in addition to the centrifugal separation machine, an interference chamber and an NO_x decomposition unit connected to the centrifugal separation machine and provided at an upstream side of a second exhaust gas pipe of the interference chamber, with both the centrifugal separation machine and the NO_x decomposition unit being arranged separately from the interference chamber, and wherein this decomposition unit includes the barrier discharge electrode portion and plural discharger disc plates having plural discharge portion slits at an outer periphery of the insulation electrode portion. Note each of claims 8-10.

In addition, it is respectfully submitted that these references would have neither disclosed nor would have suggested such an exhaust gas processing apparatus as set forth in the foregoing, having features as discussed previously, and moreover, wherein, as an anti-environment material, at least one of a brush, a heater, a burner and a high pressure injection nozzle is provided separately from a processing system having the interference chamber (see claim 9); or wherein, to catch and decompose a particle shape substance in an exhaust gas and a substance containing at least NO_x, the interference chamber mitigates and averages

a change of a flow in a front stage of a processing system having the interference chamber (note claim 10).

Furthermore, it is respectfully submitted that these references would have neither disclosed nor would have suggested such an exhaust gas processing apparatus as in the present claims, having features as discussed previously, and additionally including (but not limited to) wherein the centrifugal separation machine is provided in a front stage of a processing system having the interference chamber (see claim 2); and/or wherein an air pressure generation apparatus is constituted in the processing system having the interference chamber (see claim 3); and/or wherein the centrifugal separation machine is combined with an electric dust collection apparatus of the exhaust gas processing apparatus (see claims 6 and 7); or wherein the apparatus further includes a dust collection filter between the centrifugal separation machine and the NO_x decomposition unit (see claim 12); and/or wherein the centrifugal separation machine is separately arranged from the NO_x decomposition unit, the NO_x decomposition unit being downstream of the centrifugal separation machine (see claim 11).

By the present invention, having the centrifugal separation machine arranged separately from the interference chamber and the NO_x decomposition unit arranged separately from the interference chamber, both the centrifugal separation machine and the NO_x decomposition unit can be arranged bypassing the exhaust gas passage in the interference chamber (that is, the main exhaust gas processing apparatus), and it is possible to perform NO_x decomposition in real time.

Furthermore, by having the NOx decomposition unit and centrifugal separation machine separately arranged from the interference chamber, the particle shape substances can be averaged and processed in a real time.

In addition, by having the barrier discharge electrode portion forming part of the NOx decomposition unit, with this electrode portion as in the present claims, the processing of the harmful substances in real time is facilitated.

As for advantages according to the present invention as described in Applicant's specification, note, for example, page 17 thereof.

U.S. Patent No. 4,693,078 discloses a soot afterburner for a motor-vehicle exhaust system, that burns soot separated out of the exhaust-gas stream of, for instance, a diesel engine. The afterburner has a housing centered on an upright axis and having a generally cylindrical upper portion having a downwardly open lower end, and a lower portion tapering toward the axis from the lower end of the upper portion and having at the axis a downwardly closed lower end. An exhaust tube opens at the axis into the upper housing portion above the lower end thereof, and a feed tube opening tangentially into the upper housing portion above the lower end thereof introduces the particle-laden gas stream tangentially into the upper housing portion. An electrical heating element at the axis at the lower end of the lower housing portion burns the soot particles collected therein. Note column 1, lines 48-65. See also column 2, lines 16-24 and 58 and 59. Note also column 4, lines 22-25, disclosing the injection of a catalyst into a venturi for combustion gases for the afterburner.

It is respectfully submitted that Dettling, et al. is concerned with an afterburner including collection of soot particles of a gas stream from an internal combustion engine. It is respectfully submitted that this patent does not disclose, nor would have suggested, such exhaust gas processing apparatus as in the present claims, including, inter alia, the NOx decomposition unit, much less an interference chamber and wherein the centrifugal separation machine and NOx decomposition unit are arranged separately from the interference chamber, or the other aspects of the present invention as discussed in the foregoing.

The contention by the Examiner that No. 4,693,078 discloses an exhaust gas processing apparatus having at least one centrifugal separation unit, is noted. However, it is further noted that the claims as presently amended recite apparatus including the interference chamber, the centrifugal separation machine and the NOx decomposition unit, the centrifugal separation machine and the NOx decomposition unit being further defined. It is respectfully submitted that even as interpreted by the Examiner, No. 4,693,078 would have neither disclosed nor would have suggested the present invention, including features thereof as discussed previously.

U.S. Patent No. 4,649,703 discloses an apparatus for removing solid particles from internal combustion engine exhaust gases, the apparatus including (note Fig. 1) a connecting line 1 discharging at a tangent into a spiral housing 3, which is appended coaxially to the end of an elongated tube 4 such that it is open on the end adjacent to the tube diameter. On the other end of the tube, a second spiral

housing 6 is appended; and a connection 7 leads off at a tangent from the spiral housing 6 and in turn discharges at a tangent into an inflow cylinder 8 of a centrifugal filter 9. See column 3, lines 48-64. This patent discloses that from the inflow cylinder 8 inward, an immersion tube 15 extends coaxially in the cylinder 10, from whence it carries relatively uncontaminated gas to the outside; and that extending coaxially into the tube 4 is an electrode support 16 of electrically conductive material, on which a plurality of electrode discharge discs 17 are lined up at regularly spaced intervals, with a plurality of shaped edges or pointed tips being provided at their circumference. Note column 4, lines 1-10. This patent discloses that the unit 4 represents an electrostatic agglomerator. See column 4, lines 33 and 34. This patent emphasizes that the exhaust gas speed in the tube 4 is to be a high speed, which dictates that the soot particles have only a fleeting contact with the wall of the tube 4, and thus no growing deposits are formed and there is no settling out of soot within the tube 4. See column 5, lines 34-47; see also column 6, lines 6-16. Note also column 7, lines 19-22, disclosing an additional cyclone precipitator 28 (note Fig. 1) disposed upstream of the mouth of the connecting line into the spiral housing 3.

It is emphasized that tube 4 acts as an electrostatic agglomerator. It is respectfully submitted that No. 4,649,703 would have neither disclosed nor would have suggested such apparatus as in the present claims, including, inter alia, the NOx decomposition unit. Moreover, noting the tube 4 of electrostatic soot shunt 2, it is respectfully submitted that this reference does not disclose nor would have

suggested apparatus as in the present claims, including the interference chamber and with the centrifugal separation machine and NOx decomposition unit arranged separately from the interference chamber, and advantages thereof as described in Applicant's original disclosure; and/or other features of the present invention as in the present claims and discussed previously.

The contention by the Examiner on page 4 of the Office Action mailed May 5, 2004, that No. 4,649,703 discloses at least one interference box for mitigating and averaging a change of a flow in a front stage of processing system, the Examiner referring to Fig. 1 of No. 4,649,703, is respectfully traversed. It is respectfully submitted that No. 4,649,703 would have neither disclosed nor would have suggested an apparatus having the components as in the present claims, with positioning thereof; and, moreover, wherein the interference chamber mitigates and averages a change of a flow in a front stage of a processing system having this interference chamber, and advantages thereof as in the present claims; and/or the other features of the present invention as in the present claims, and advantages thereof.

In view of the foregoing comments and amendments, reconsideration and allowance of all claims presently in the application, are respectfully requested.

To the extent necessary, Applicant petitions for an extension of time under 37 CFR § 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to the Deposit Account No. 01-2135

(Case No. 840.42873X00), and please credit any excess fees to such Deposit
Account.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "William I. Solomon", written over a horizontal line.

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